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APPLICANT : MORI KENJIRO;

INVENTOR : ARAI TOSHIYUKI;

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TITLE : DETECTION OF NUCLEAR MAGNETIC RESONANCE OF  $^{17}\text{O}$

ABSTRACT : PURPOSE: To detect  $^{17}\text{O}$  existing in the form of  $\text{H}_2^{17}\text{O}$  in a living body and to safely obtain the information on tissue reflux and metabolic functions by taking a resonating agent contg. the  $^{17}\text{O}$  at the ratio above the natural presence into the living body and subjecting the  $^{17}\text{O}$  to nuclear magnetic resonance.

CONSTITUTION: The gaseous oxygen in which, for example, the stable isotope element  $^{17}\text{O}$  of oxygen is incorporated at the ratio (for example, 44%) above the natural presence ratio (0.037%) is used as the resonating agent. The  $^{17}\text{O}$  outputs a resonance signal only when the  $^{17}\text{O}$  exists in the form of the  $\text{H}_2^{17}\text{O}$  in the living body if the  $^{17}\text{O}$  is subjected to the nuclear magnetic resonance and, therefore, the increase or decrease in the  $\text{H}_2^{17}\text{O}$  is known according to a change in the resonance signal with lapse of time. The cells with which the metabolism is active produce a large amt. of the  $\text{H}_2^{17}\text{O}$  and the cells with which the metabolism is not active produce the  $\text{H}_2^{17}\text{O}$  by a slight amt. each and, therefore, the state of the metabolism is recognized by a difference in signal intensity. Since the in vivo  $\text{H}_2^{17}\text{O}$  is carried to each tissue through the circulation, the resonance signal is kept detected and the information on the tissue reflux is obtd.

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